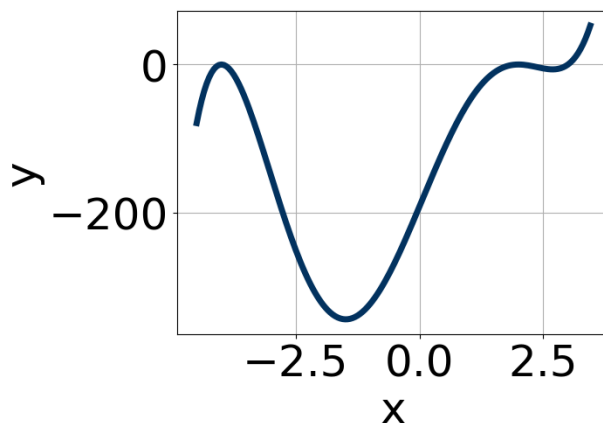1. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.
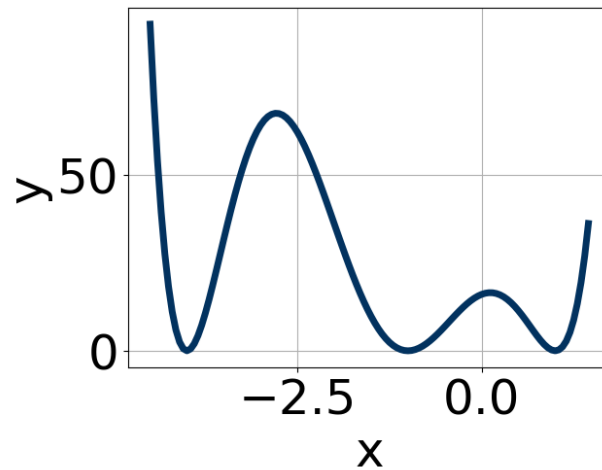
$$-2 - 5i \text{ and } 3$$

A. $b \in [-0.9, 3.8], c \in [16, 20.1]$, and $d \in [-91, -82]$

B. $b \in [-1.5, 0.8], c \in [16, 20.1]$, and $d \in [84, 91]$

C. $b \in [-0.9, 3.8], c \in [-3.2, -0.5]$, and $d \in [-6, -1]$

D. $b \in [-0.9, 3.8], c \in [0.2, 7.4]$, and $d \in [-15, -11]$

E. None of the above.

---

2. Which of the following equations *could* be of the graph presented below?

A. $13(x + 4)^6(x - 2)^5(x - 3)^9$

B. $-18(x + 4)^4(x - 2)^{10}(x - 3)^6$

C. $8(x + 4)^6(x - 2)^8(x - 3)^9$

D. $3(x + 4)^8(x - 2)^9(x - 3)^4$

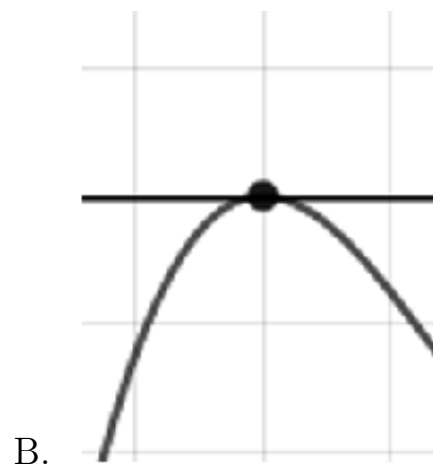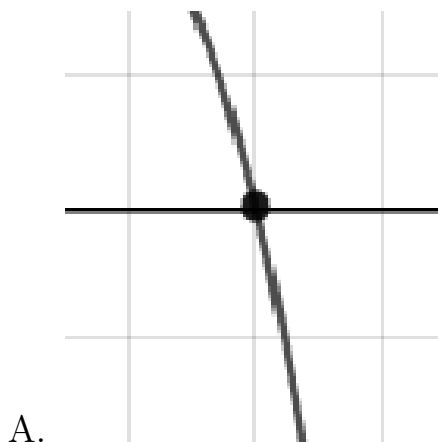E. $-8(x + 4)^4(x - 2)^8(x - 3)^5$

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3. Which of the following equations *could* be of the graph presented below?

A. $-18(x+4)^{10}(x+1)^4(x-1)^8$

B. $20(x+4)^8(x+1)^5(x-1)^7$

C. $18(x+4)^6(x+1)^4(x-1)^8$

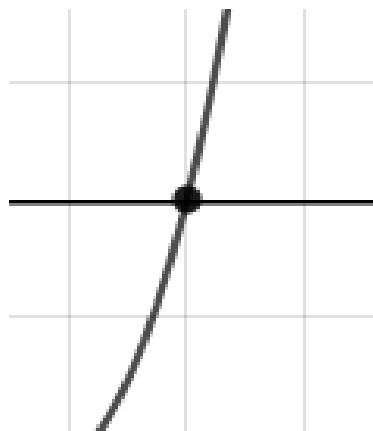D. $-4(x+4)^{10}(x+1)^{10}(x-1)^7$

E. $6(x+4)^8(x+1)^4(x-1)^7$

---

4. Describe the zero behavior of the zero $x = 6$ of the polynomial below.

$$f(x) = -3(x+4)^8(x-4)^5(x+6)^6(x-6)^5$$

A.

B.

C.

D.

E. None of the above.

---

5. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-2 + 5i \text{ and } 1$$

A. $b \in [2.3, 3.6], c \in [24, 32], \text{ and } d \in [-30, -20]$

B. $b \in [-1.2, 1.7], c \in [-10, -3], \text{ and } d \in [0, 12]$

C. $b \in [-1.2, 1.7], c \in [-1, 13], \text{ and } d \in [-5, 0]$

D. $b \in [-5.5, -1.7], c \in [24, 32], \text{ and } d \in [23, 32]$

E. None of the above.

---

6. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.
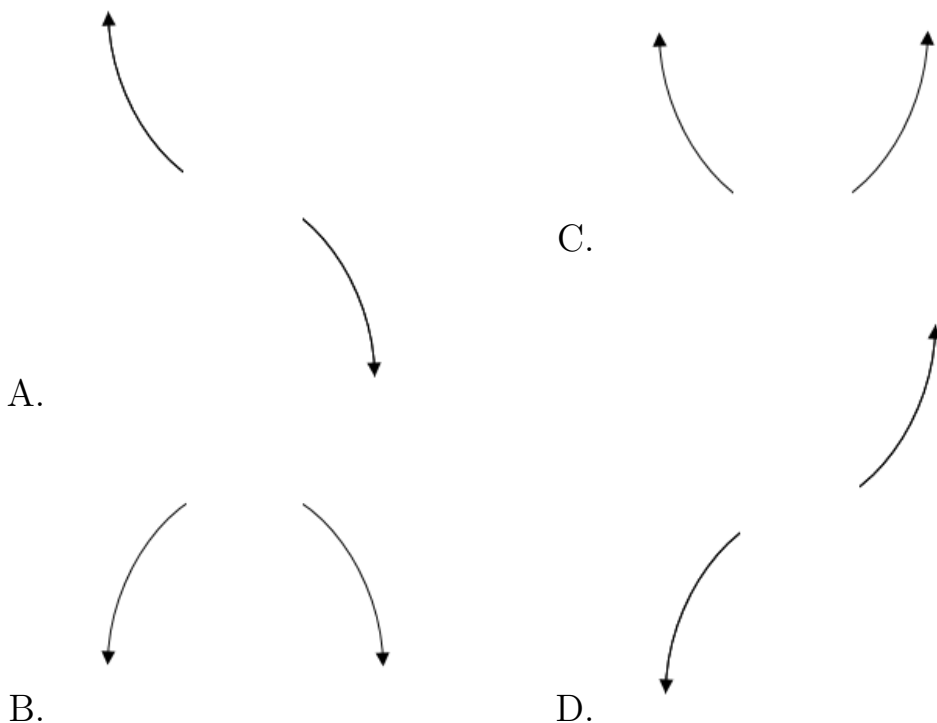
$$2, \frac{1}{5}, \text{ and } \frac{-1}{4}$$

A. $a \in [17, 29], b \in [-39.3, -36.6], c \in [-5.1, -0.4], \text{ and } d \in [-4, 0]$

B. $a \in [17, 29], b \in [47.6, 51.5], c \in [18.7, 20.3], \text{ and } d \in [2, 8]$

C. $a \in [17, 29], b \in [-39.3, -36.6], c \in [-5.1, -0.4], \text{ and } d \in [2, 8]$

D. $a \in [17, 29], b \in [33.4, 40.5], c \in [-5.1, -0.4],$ and $d \in [-4, 0]$

E. $a \in [17, 29], b \in [39.7, 41.9], c \in [-2, 2.2],$ and $d \in [-4, 0]$

---

7. Describe the end behavior of the polynomial below.

$$f(x) = 5(x-5)^4(x+5)^5(x-6)^5(x+6)^6$$

A.

B.

C.

D.

E. None of the above.

---

8. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$-5, \frac{-2}{3}, \text{ and } \frac{-7}{5}$$

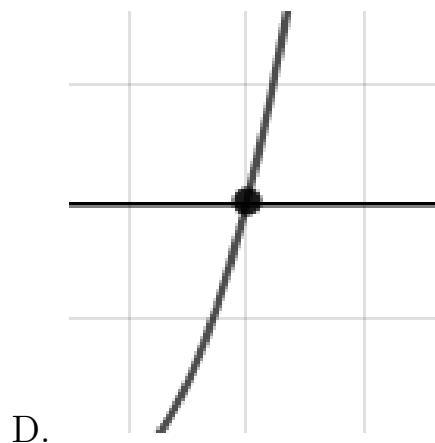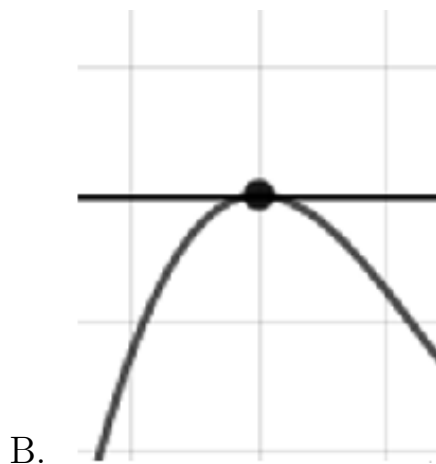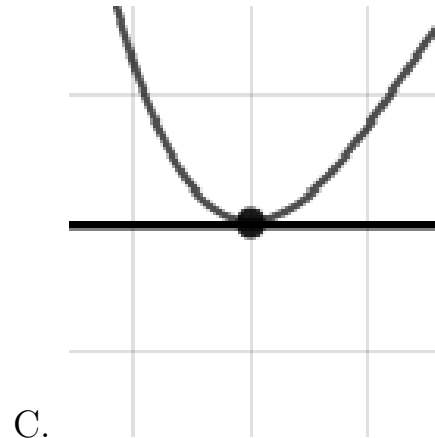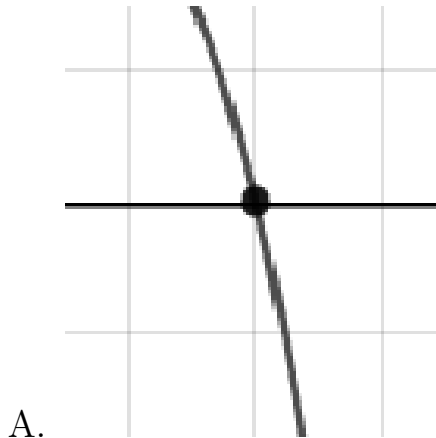A. $a \in [12, 16], b \in [103, 110], c \in [161, 178],$ and $d \in [-74, -62]$

B. $a \in [12, 16], b \in [-72, -57], c \in [-75, -65],$ and $d \in [68, 74]$

C. $a \in [12, 16], b \in [-45, -43], c \in [-142, -136],$ and $d \in [-74, -62]$

D. $a \in [12, 16], b \in [-113, -105], c \in [161, 178],$ and $d \in [-74, -62]$

E. $a \in [12, 16], b \in [103, 110], c \in [161, 178],$ and $d \in [68, 74]$

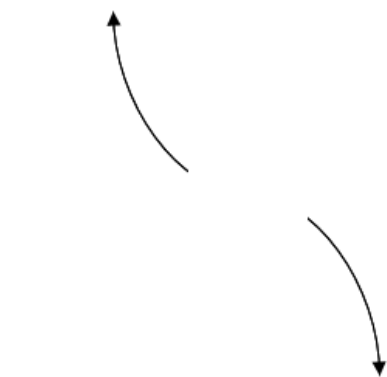9. Describe the zero behavior of the zero $x = -9$ of the polynomial below.

$$f(x) = -9(x-9)^4(x+9)^5(x+3)^9(x-3)^{10}$$

A.

C.
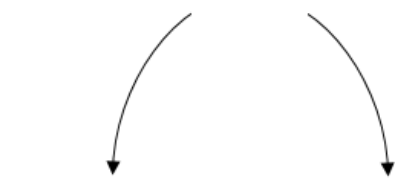
B.

D.

E. None of the above.

10. Describe the end behavior of the polynomial below.

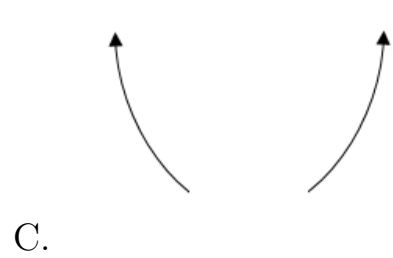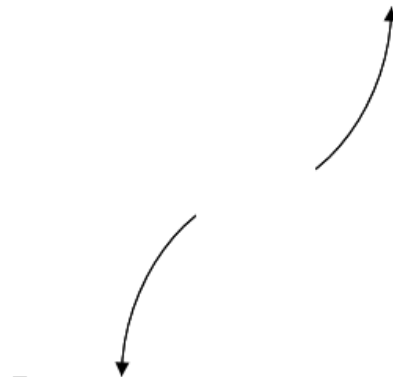$$f(x) = 5(x-5)^5(x+5)^{10}(x-8)^5(x+8)^7$$

A.

C.

B.

D.

E. None of the above.